

<https://helda.helsinki.fi>

Social support and breast cancer : A comparatory study of
breast cancer survivors, women with mental depression,
women with hypertension and healthy female controls

Salakari, Minna

2017-10

Salakari , M , Pylkkänen , L , Sillanmäki , L , Nurminen , R , Rautava , P , Koskenvuo , M & Suominen , S 2017 , ' Social support and breast cancer : A comparatory study of breast cancer survivors, women with mental depression, women with hypertension and healthy female controls ' , Breast , vol. 35 , pp. 85-90 . <https://doi.org/10.1016/j.breast.2017.06.017>

<http://hdl.handle.net/10138/311396>

<https://doi.org/10.1016/j.breast.2017.06.017>

cc_by_nc_nd

acceptedVersion

Downloaded from Helda, University of Helsinki institutional repository.

This is an electronic reprint of the original article.

This reprint may differ from the original in pagination and typographic detail.

Please cite the original version.

SOCIAL SUPPORT AND BREAST CANCER: A COMPARATORY STUDY OF BREAST CANCER SURVIVORS, WOMEN WITH MENTAL DEPRESSION, WOMEN WITH HYPERTENSION AND HEALTHY FEMALE CONTROLS

Minna Salakari (Corresponding author)

University of Turku, Department of Public Health, Joukahaisenkatu 3-5, 20520 Turku, Finland
minna.salakari@cancer.fi

Liisa Pylkkänen

Cancer Society of Finland, Helsinki, Unioninkatu 22, 00130 Helsinki, Finland
liisa.pylkkanen@cancer.fi

Lauri Sillanmäki

University of Helsinki, Department of Occupational Health, Mannerheimintie 172, 00300 Helsinki
lauri.sillanmaki@helsinki.fi

Raija Nurminen

University of Applied Science Turku, Ruiskatu 8, 20740 Turku, Finland
raija.nurminen@turkuamk.fi

Päivi Rautava

Turku University Hospital, Kiinanmyllynkatu 4-8, 20520 Turku, Finland
paivi.rautava@utu.fi

Markku Koskenvuo

University of Helsinki, Department of Occupational Health, Mannerheimintie 172, 00300 Helsinki
markku.koskenvuo@helsinki.fi

Sakari Suominen

University of Turku, Department of Public Health, Joukahaisenkatu 3-5, 20520 Turku, Finland
sakari.suominen@utu.fi

ABSTRACT

Among breast cancer (BC) survivors, inadequate social support (SS) is associated with a significant increase in cancer-related mortality and reduction in quality of life (QoL).

The aim of the study was to explore perceived SS during BC trajectory by comparing BC survivors, women with depression, women with arterial hypertension, and healthy female controls to each other. Another aim was to compare perceived balance of receiving and providing SS.

The data of ongoing prospective postal survey was linked with national health registries. Respondents with BC (n=64), depression (n=471), arterial hypertension (n=841) and healthy controls (n=6274) formed the study population. SS was measured by a Sarason's 6-item shortened version of the Social Support Questionnaire (SSQ). The modified Antonucci's (1986) social support convoy model of the network of individuals was used to measure the dominating direction of SS.

The main provider of SS for all participants combined was the spouse or partner (94.3 %), close relative (12.0%) and friends (5.4%). In all groups, particularly in the BC and arterial hypertension group, spouse or partner was seen as the most important supporter. The group suffering from depression reported significantly less SS in each domain of appraisal ($p<0.001$). In total, 24.6 % of all respondents reported receiving more support than they provided (receipt dominance).

SS is a well-known determinant of wellbeing. Our study lends support to the spouse's or the partner's central role during the recovery phase of BC. Identification of factors improving the overall QoL of BC survivors is an important public health challenge.

Keywords: Breast Cancer, Comparative study, Social environment, Social support, Survivorship

INTRODUCTION

Among females breast cancer (BC) is the most frequently diagnosed form of cancer. [1] Due to significant improvements in recent decades in screening protocols, diagnostic procedures, and treatment, BC mortality has decreased worldwide. [2, 3, 4] However, BC and its treatment causes considerable harm to women in various life spheres including wellbeing. [5] Psychological and social problems among adult cancer survivors include the need for social support (SS), depression, anxiety, fear of recurrence, and impacts on family [6]. Hence, the disease is a serious threat to the patients' quality of life (QoL). [7, 8]

Perceived SS can also include dimensions of social integration [9] and has been shown to be related to various areas of health behavior [10]. Among BC survivors, inadequate SS is associated with a substantial increase in cancer-related mortality. [11] Social isolation is a similar health risk factor as the more traditional ones like high blood pressure, obesity, and smoking. [9] Increased SS, on the other hand, shows positive effects on BC patients' physical, psychological and social functioning and on their QoL. [12, 13, 14, 15] SS is identified to be associated with improved survival of BC patients. [16] Generally perceived emotional support and a large, diverse social network, have been shown to strongly protect against depression [17].

Family environment as a source of SS plays a central role in BC patients' coping strategies, and plays a significant role in increasing cancer patients' abilities to cope with the disease. [18] It is an important resource of cancer patients' efforts to stay healthy. [19, 20] Adequate SS also improves sexual functioning and overall QoL. [21, 22]

There is still limited knowledge about the origin of SS among BC survivors, particularly in comparison with individuals suffering from other long-term illnesses, and healthy controls.

In this study we focused on the SS received from a spouse, partner or other close individuals. We hypothesized that particularly women with BC, in their recovery phase, experience the greatest SS from a spouse or a partner, and that this support is pronounced in the BC group as compared to individuals with other long-term illnesses and on the other hand healthy controls. The aim of the study was to explore perceived SS during BC recovery phase by comparing four groups of women to each other, i.e., 1) BC survivors, 2) women with mental depression, 3) women with arterial hypertension, and 4) healthy female controls. Another aim was to compare perceived balance of receiving and providing SS in these four groups.

MATERIAL AND METHODS

Participants

The Health and Social Support (HeSSup) study is an ongoing, nationwide prospective cohort study of a representative sample of the four age groups (20–24, 30–34, 40–44 and 50–54 years) in Finland. The study was initiated in 1998. Follow-up postal surveys have been carried out in 2003 and 2012. The total number of participants in 1998 was 25,895, and the number of female participants was 15,267.

All data presented in this study are drawn from the 2003 questionnaire survey, which was used to maximize the number of observations in the BC group and enable sufficient follow-up for BC-specific survival. This survey data was linked with the Finnish Cancer Registry data, Drug Purchase and Reimbursement Registry of the Social Insurance Institution and mortality data from Statistics Finland for the years 1999 – 2007. For BC survival the patients were followed up until 2015. The respondents who had a registered diagnosis of BC, and no arterial hypertension (had not purchased anti-hypertensive medication) or any other chronic disease formed the study group (N=64). Also those women with BC (n=9), who had reported depression and had anti-depressive medication, were included.

There were three comparison groups for the BC group: 1) respondents who reported having suffered from depression, and had purchased anti-depressive medication (N=471); 2) respondents who reported having arterial hypertension, and had purchased anti-hypertensive medication (N=841); and 3) all respondents of corresponding age who had not reported any chronic disease, any cancer, depression or hypertension (N=6,274). The total number of BC survivors after initial recovery was relatively low, as the age of participants was generally low. Respondents diagnosed with BC prior to 1998 were excluded from the study. All respondents were women. None in the comparison groups had any cancer disease. Study design is shown in Figure 1.

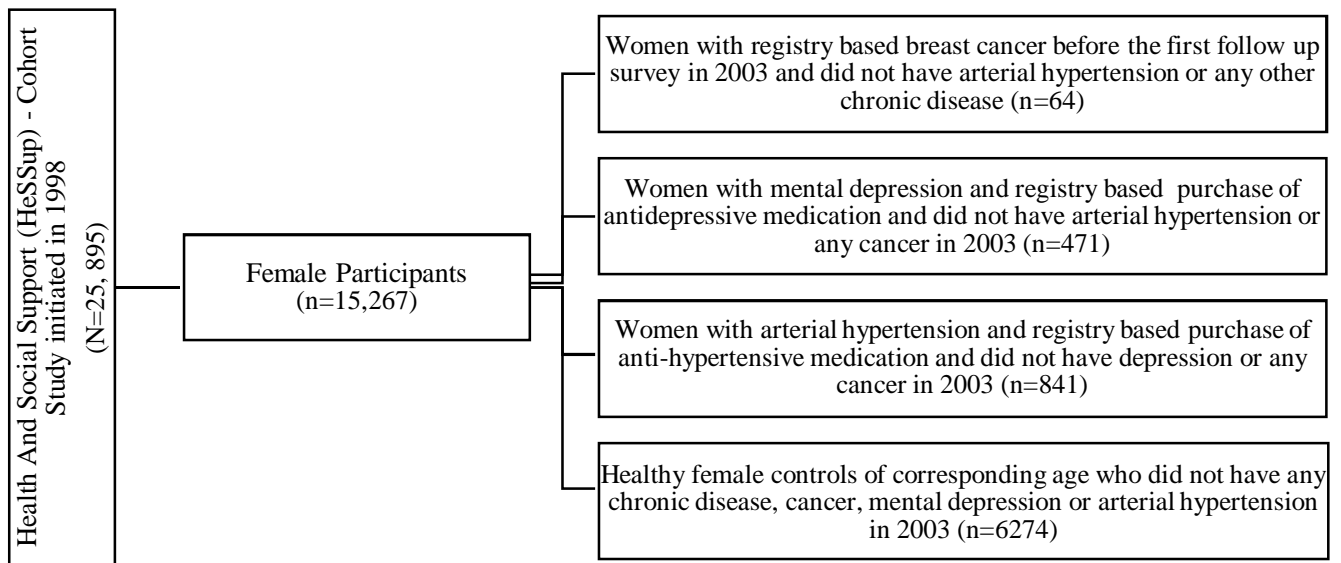


Figure 1. Study Design

Outcome Variables

Perceived SS was measured by a Sarason's 6-item shortened version of the original Social Support Questionnaire (SSQ) [23]. Each item solicits a two-part answer: 1) the scores for number of sources of SS and 2) satisfaction with SS that is available. The response options were: spouse/partner, some other close relative, close friend, close co-worker, close neighbor, another close person, and no one. For each question, one or more response options/person could be chosen.

The balance of perceived SS, i.e. whether they currently received or provided more support themselves from or to the persons mentioned above was determined by the adapted and modified Antonucci's (1986) social support convoy model of the network of individuals moving with the person through time and with whom the person exchanges SS [24]. If the respondent reported more receipt than provision of SS this is from here on called receipt dominance and if she again reported more provision than receipt of SS this is called provision overload. Respondents were also asked to report the gender of the supporter.

The respondents' level of education was classified into four categories: no professional education; vocational course or school/apprentice contract; college; and university/other high level education.

Statistical Analyses

The youngest age group (20–24 years) was omitted from the statistical analysis since there was only one respondent with BC.

Overall associations between the variables were measured with the Cochran-Mantel-Haenszel test. The following descriptive statistics were calculated: frequency, mean with 95 % confidence intervals, range and median. The limit for statistical significance was set at $p = 0.05$.

The distributions for perceived SS (SSQ, Sarason et al 1983) were highly skewed (range 0 - 6). The balance of SS formed three groups which were receipt dominance, an equal situation and provision overload.

Statistical analyses were performed with the SAS[®] software v.9.4 for Windows (SAS Institute Inc., USA).

Ethics

Since the HeSSup study was not a medical study, the concurrent joint Ethics Committee of the University of Turku and the Turku University Central Hospital considered formal approval not necessary and stated that the study followed the ethical guidelines for good scientific practice.

RESULTS

Baseline characteristics

Respondents were evenly distributed between each age group, most of them were married (62.8 %), had vocational course/school or college education (70.8 %), lived with their spouse or partner (77.5 %), had children (84.3 %), and were employed or students (80.6 %). Respondents' age is presented in Table 1 and marital status in Table 2.

The group with women suffering from mental depression differed statistically significantly from the other groups in marital status. They were less often married than women in any other group, 34% of the respondents in the depression group lived alone, while in the other groups 24% lived alone. The difference was statistically significant (Fisher's exact test, $p < 0.001$). There were no significant differences between the other two groups and the controls.

The age and educational distributions were consistent in all groups, which enables the comparisons between different groups.

Table 1. Number and percentage of the women studied by age.

Age	30– 34 years		40– 44 years		50– 54 years		All	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Breast cancer	4	6.3	23	35.9	37	57.8	64	100
Depression	138	29.3	187	39.7	146	31.0	471	100
Arterial hypertension	70	8.3	215	25.6	556	66.1	841	100
Healthy controls	2330	37.1	2181	34.8	1763	28.1	6274	100
<u>Total</u>	2542	33.2	2606	34.1	2502	32.7	7650	100.0

Table 2. Number and percentage of the women studied by marital status

Marital status	Unmarried		Married		Cohabitation		Divorced or Separation		Widow		All	
	N	%	N	%	N	%	N	%	N	%	N	%
Breast cancer	4	6.3	45	70.3	6	9.4	9	14.1	0	0	64	100
Depression	69	14.7	239	50.9	63	13.4	84	17.9	15	3.2	470	100
Arterial hyper-tension	54	6.5	565	67.7	79	9.5	102	12.2	35	4.2	835	100
Healthy controls	586	9.4	3937	63.0	865	13.8	735	11.8	129	2.1	6252	100
<u>Total</u>	713	9.4	4786	62.8	1013	13.3	930	12.2	179	2.4	7621	100

Sources of social support

The research group determined the three groups of persons considered the closest. These were the partner/spouse, a close relative and a close friend/neighbor. The main providers of SS for women with BC, mental depression or arterial hypertension, and for healthy female controls is presented by age groups and as combined in Table 3. When all age groups were combined, the main providers of SS of those who did not live alone were the spouse or partner (94.3 %), close relative (12.0%) and close friend (5.4%). In all groups, spousal support was seen as the most important form of SS. In particular, in the BC and arterial hypertension groups, a spouse or a partner was seen as the most important supporter. The group with individuals suffering from mental depression differed statistically significantly from the two other groups and the controls in each domain ($p < 0.001$) and those of them who had a spouse or a partner reported spouse's/partner's support less often as the

main provider of support ($p=0.032$). There were no significant differences between the other two groups and the controls.

Table 3. The main sources of perceived social support for women with breast cancer, mental depression, arterial hypertension and the healthy controls by age groups combined

Group	Spouse/Partner ^a		Close Relative		Close friend		Total	
	N	%	N	%	N	%	N	%
Breast cancer	40	97.6	4	8.9	1	2.2	45	0.74
Mental depression	235	91.1	60	17.1	39	11.1	352	5.8
Arterial hypertension	511	96.8	47	7.8	21	3.5	603	9.9
Healthy controls	4031	94.1	624	12.2	267	5.2	5113	83.6
Total	4817	94.3	735	12.0	328	5.4	6113	100.0

^a In the column are included only women with a spouse or a partner

Balance of receiving and providing social support

The greatest share of all respondents (40.8 %) reported receiving and providing SS equally or reported provision overload (34.6 %). However, as many as 24.6 % of all respondents reported receipt dominance (Table 4.) When scrutinizing the groups separately, the group with arterial hypertension reported significantly less receipt dominance and significantly more provision overload as compared to the other groups, $p=0.003$ (Cochran-Mantel-Haenszel –test for General Association). BC survivors and the group suffering from mental depression reported slightly more SS receipt dominance than the healthy controls. However, this difference was not statistically significant. (Table 4).

The effect of prognosis on BC patients' social support

When the HeSSup data from year 2003 was linked to registry-based data to enable follow-up for mortality until 2015, it was found that a total of 10 women in the BC group finally died from BC. When the perceived SS of these women ($n=10$) in their early recovery phase during the actual study period was compared to that of the rest ($n=54$), no statistically significant differences could be detected. The overall mortality of the BC group (20.3%) was significantly higher than in the groups of arterial hypertension (4.04%), mental depression (3.4%) and healthy controls (1.8%).

Table 4. The balance of receiving and providing social support

Group	Receives support more than provides (receipt dominance)		Receives and provides support equally		Provides support more than receives (provision overload)		Total	
	N	%		N	%		N	%
Breast cancer	17	26.6	25	39.1	22	34.4	64	0.84
Mental depression	125	26.9	182	39.2	157	33.8	464	6.2
Arterial hypertension	156	19.0	338	41.2	327	39.8	821	10.9
Healthy controls	1553	25.1	2527	40.9	2101	34.0	7530	82.1
Total	1851	24.6	3072	40.8	2607	34.6	7530	100

DISCUSSION

The results obtained from this nationwide prospective cohort study describe the availability of SS from different sources in BC survivors in comparison to individuals with mental depression, arterial hypertension and healthy controls. The study also determined the main providers of the SS, and the respondents' perceived balance of receiving and providing SS. Our results showed that the spousal/partner support was experienced as the most important source of SS in all groups. Also, in the BC group, a spouse or a partner was seen as the significantly most important supporter in comparison with the depression group. Hence, our hypothesis of the dominant spousal role in the provision of SS to particularly BC survivors as compared to other groups was not validated.

Social environment is a well-recognized determinant in health and wellbeing. Among BC patients, inadequate SS is associated with a substantial increase in cancer-related mortality. [25] In addition, social isolation is associated with reduced long-term survival following a diagnosis of various types of cancer, including BC. Most of the disease management takes place in the family environment, whether by the patient alone or with other family members [26, 27].

The results of the current study are consistent with previous studies: spouses or partners are often identified as the major source of SS throughout the cancer trajectory. [28, 29, 30, 31] Spouses or partners are the significant source of symptom relief, and the support could lead to better management of the disease. [32] Song et al. (2016) found that SS received from a spouse or a partner was associated with better psychological well-being and long-term QoL. [33]

One additional interesting finding in this study was seen in the group of mental depression as compared to the other groups in terms of SS from spouse/partner and the balance of SS (Table 3.). The depressed differed in an unfavorable direction from the other groups in each domain of appraisal. On the other hand, between the BC group and the other groups except the depressed one there were no statistically significant differences in terms of closest people. This may be due to the fact that the numbers of women with mental depression lived significantly more often alone (Table 2). However, the difference between the depressed and the other was not solely based on the fact that they were more often single since the results remains unchanged when including only respondents with a spouse or a partner.

Marital status is strongly associated with improved health and longevity. Being married has also been shown to be positively associated with survival in patients with different types of malignancy. [34] Marital status (divorced and singles) and poor SS increase the risk of depression. [35] Those with no family request and receive SS from friends and more often, for example, professionals. [36] Van den Brink et al. (2017) concluded that if depressed persons experience difficulties in their social relationships, this impedes their recovery. [37] It has also been found that when stress increases in depressed persons, the support available from family decreases. [38]

The SS from a spouse and partner was particularly important in persons with BC and hypertension (Table 5). Kroenke et al (2006) [11] found that the number of close friends and relatives as reported prior to BC diagnosis was associated with improved survival following the BC diagnosis even after adjusting for BC stage at diagnosis. As predicted, in the present study, SS received from friends were seen as being clearly at a lower level than the support received from the spouse in the BC group. Based on the existing literature, support from spouses or partners can help with successful adaptation to BC and it can improve the overall well-being [19,39] BC survivors seem to cope better with the disease, if they are married, lived with family, have children and are employed. [34, 40] BC survivors also expect and need SS mostly from family members and significant others and less from friends. [41]

The experience of a life threatening illness, such as BC, requires a person to consider a range of emotional, social and existential demands. Diagnosis of BC causes uncertainty and fears and often challenges a woman's identity, self-esteem, body image and also social relationships. Protective factors for distress include supportive social networks, such as family and professional resources. Research shows that SS provides actual benefits for BC survivors. Irrespective whether it is informal support from family and friends, or a more formal support from group, SS can improve

survivors' QoL. [42] Further, prospective cohort studies [11, 43, 44, 45] suggest that survivors with more SS show better overall coping and survival.

Greater social network and emotional support close to BC diagnosis may relieve women's suffering by strengthening coping skills, providing SS, and increasing opportunities to obtain cancer-related information. The dyadic relationship may be critical in determining BC survivors' distress and needs, and may prove being a good target for supportive interventions. Social relationship-based interventions represent a major opportunity to improve the QoL and also survival of BC patients.

Strengths and limitations

The strengths of the study include the use of reliable registry data, so we did not need to rely only on self-reported data. According to concurrent legislation, The Finnish Cancer Registry collects systematically data on all cancer cases in Finland. Moreover, all medications are registered by The Finnish Drug Purchase and Imbursement Registry of the Social Insurance Institution, so the allocation of patients within groups is reliable. Other strengths are the extensive source data of more than 15,000 women, and careful follow-up of the individuals in the study. The study included a low total number of BC survivors, but in spite of this due to the study design the BC patient group can be considered reliable and unbiased.

The present study has several limitations. At the baseline HeSSup study, the study participation rate was moderate, only 40 %. Nevertheless, an analysis of non-respondents has shown that the sample regarding health parameters is representative for the Finnish population. [46] Our results can only be generalized to young women (below 55 years) with BC.

As the number of young (under 55 years) BC survivors is generally low it places this research data in a unique position. The group of BC patients in this study represents a very special group, as the majority of BC patients in the general population are over 60 years. Young BC patients may have special needs for psychosocial support, which has to be further investigated. In Finland, practically all BC patients, in addition to medical treatment, undergo various supplementary interventions. Unfortunately, no information about the interventions on the individual level is available in this study.

CONCLUSION

Social environment is a well-recognized determinant in health and wellbeing. SS is one of the basic forms of social interaction and an indispensable part of human life. Identification of factors that improve the overall QoL of BC survivors is an important public health challenge.

Our study lends support to the spouse's or the partner's central role as provider of SS during the recovery phase of BC. Even though the need of SS is increased in the BC recovery phase women diagnosed with BC did not, however, report more receipt of SS as compared to healthy controls.

And finally, to improve and maintain the BC survivors' QoL, it is important to develop and provide support services, not only for BC survivors, but also for their families and other significant others, as their role in the support of BC patients is crucial.

FUNDING

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

- [1] Boyle P, Levin B. 2008. World cancer report. IARCPress, Lyon, ISBN: 9789283204237
- [2] Siegel R, Naishadham D, Jemal A. Cancer statistics, 2012. *CA Cancer J Clin*. 2012 Jan-Feb;62(1):10-29. doi: 10.3322/caac.20138. Epub 2012 Jan 4.
- [3] Coleman MP. Cancer survival in five continents: a worldwide population-based study (CONCORD). *Lancet Oncol* 2008, 9(8):730-56.
- [4] Ferlay J, Bray F, Forman D, Mathers C, Parkin DM: GLOBOCAN 2008 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer 2010 [<http://globocan.iarc.fr>].
- [5] MacDonald BH. Quality of life in cancer care: patients' experiences and nurses' contribution. *Eur J Oncol Nurs*. 2001 Mar; 5(1):32-41.
- [6] Schmid-Büchi S., Halfens RJ, Muller M, Dassen T, van den Borne B. Factors associated with supportive care needs of patients under treatment for breast cancer. *Eur J Oncol Nurs* 2013; 17: 22–29. Jarrett et al 2013
- [7] Curtis R, Groarke A, McSharry J, Kerin M. Experience of breast cancer: burden, benefit, or both? *Cancer Nurs* 2014; 37: E21–30.
- [8] Carlson, L. E., Bultz, B. D. Cancer distress screening: Needs, models, and methods. *Journal of Psychosomatic Research* 2003; 55(5): 403-409. (2003)
- [9] House JS, Landis KR, Umberson D. Social relationships and health. *Science*. 1988; 241:540–5.
- [10] Rice LJ, Halbert CH. Social Networks Across Common Cancer Types: The Evidence, Gaps, and Areas of Potential Impact. *Adv Cancer Res*. 2017;133:95-128. doi: 10.1016/bs.acr.2016.09.002. Epub 2016 Nov 29.
- [11] Kroenke CH, Kubzansky LD, Schernhammer ES, Holmes MD, Kawachi I. Social networks, social support, and survival after breast cancer diagnosis. *J Clin Oncol*. 2006; 24:1105–11. [PubMed:16505430]
- [12] Arving C, Sjöden PO, Bergh J, Hellbom M, Johansson B, Glimelius B, Brandberg Y. Individual psychosocial support for breast cancer patients: a randomized study of nurse versus psychologist interventions and standard care. *Cancer Nurs*. 2007 May-Jun;30(3):E10-9.
- [13] Winzelberg AJ, Classen C, Alpers GW, Roberts H, Koopman C, Adams RE, Ernst H, Dev P, Taylor CB. Evaluation of an internet support group for women with primary breast cancer. *Cancer*. 2003 Mar 1;97(5):1164-73.

- [14] Goodwin PJ, Leszcz M, Ennis M, Koopmans J, Vincent L, Guthrie H, et al. The effect of group psychosocial support on survival in metastatic breast cancer. *N Engl J Med*. 2001; 345:1719–26. [PubMed: 11742045]
- [15] Tehrani AM, Farajzadegan Z, Rajabi FM, Zamani AR. Belonging to a peer support group enhance the quality of life and adherence rate in patients affected by breast cancer: A non-randomized controlled clinical trial. *J Res Med Sci*. 2011. 16:658–65. [PubMed: 22091289]
- [16] Kolokotroni P, Anagnostopoulos F, Tsikkinis A. Psychosocial factors related to posttraumatic growth in breast cancer survivors: a review. *Women Health*. 2014;54(6):569-92. doi: 10.1080/03630242.2014.899543.
- [17] Santini ZI, Koyanagi A, Tyrovolas S, Mason C, Haro JM, The association between social relationships and depression: A systematic review. *J Affect Disord*. 2015 Apr 1;175C:53-65. doi: 10.1016/j.jad.2014.12.049. Epub 2014 Dec 31.
- [18] Yoo W, Shah DV, Shaw BR, Kim E, Smaglik P, Roberts LJ, Hawkins RP, Pingree S, McDowell H, Gustafson DHJ *Health Commun*. The role of the family environment and computer-mediated social support on breast cancer patients' coping strategies. 2014 Sep;19(9):981-98. doi: 10.1080/10810730.2013.864723. Epub 2014 Feb 10.
- [19] Bloom, JR. The role of family support in cancer control. In: Baider, L.; Cooper, C.; Kaplan De-Nour, A., editors. *Cancer and the family*. 2nd. Chichester, United Kingdom: Wiley; 2000. p. 55-67.
- [20] Helgeson VS, Cohen S. Social support and adjustment to cancer: reconciling descriptive, correlational, and intervention research. *Health Psychol*. 1996 Mar;15(2):135-48. Review.
- [21] Yan B, Yang LM, Hao LP, Yang C, Quan L, Wang LH, Wu Z, Li XP, Gao YT, Sun Q, Yuan JM. Determinants of Quality of Life for Breast Cancer Patients in Shanghai, China. *PLoS One*. 2016 Apr 15;11(4):e0153714. doi: 10.1371/journal.pone.0153714. eCollection 2016.
- [22] Salonen P, Tarkka MT, Kellokumpu-Lehtinen PL, Koivisto AM, Aalto P, Kaunonen M. Effect of social support on changes in quality of life in early breast cancer patients: a longitudinal study. *Scand J Caring Sci*. 2013 Jun;27(2):396-405. doi: 10.1111/j.1471-6712.2012.01050.x. Epub 2012 Jul 27.
- [23] Sarason IG., Levine HM., Basham RB. 1983. Assessing social support: The Social Support Questionnaire. *Journal of Personality and Social Psychology*, 44, 127139.

- [24] Antonucci, T.C. 1986. Measuring social support networks: Hierarchical mapping technique. *Generations*, 3, 10-12
- [25] Pinquart M, Duberstein PR. Associations of social networks with cancer mortality: a meta-analysis. *Crit Rev Oncol Hematol*. 2010 Aug;75(2):122-37. doi: 10.1016/j.critrevonc.2009.06.003. Epub 2009 Jul 14.
- [26] Ell K. Social networks, social support and coping with serious illness: The family connection. *Social Science & Medicine*. 1996; 42:173–183.
- [27] Matsuda A, Yamaoka K, Tango T, Matsuda T, Nishimoto H. Effectiveness of psychoeducational support on quality of life in early-stage breast cancer patients: a systematic review and meta-analysis of randomized controlled trials. *Qual Life Res*. 2014 Feb;23(1):21-30. doi: 10.1007/s11136-013-0460-3. Epub 2013 Jul 24.
- [28] Carlson LE, Ottenbreit N, St Pierre M, Bultz BD. Partner understanding of the breast and prostate cancer experience. *Cancer Nurs*. 2001 Jun;24(3):231-9.
- [29] Hodgkinson K, Butow P, Hunt GE, Wyse R, Hobbs KM, Wain G. Life after cancer: couples' and partners' psychological adjustment and supportive care needs. *Support Care Cancer*. 2007 Apr;15(4):405-15. Epub 2006 Oct 17.
- [30] Kinsinger SW, Laurenceau JP, Carver CS, Antoni MH. Perceived partner support and psychosexual adjustment to breast cancer. *Psychol Health*. 2011 Dec;26(12):1571-88. doi: 10.1080/08870446.2010.533771. Epub 2011 May 23.
- [31] Lim J-W, Shon E, Minso P, Daly B. The Dyadic Effects of Coping and Resilience on Psychological Distress for Cancer Survivor Couples *Support Care Cancer*. 2014 Dec; 22(12): 3209–3217. Published online 2014 Jul 4. doi: 10.1007/s00520-014-2334-9
- [32] Regan T., Lambert S, Girgis A. Kelly B., Kayser K., Turner J. Do Couple-Based Interventions Make a Difference for Couples Affected by Cancer?: A Systematic Review *BMC Cancer*. 2012; 12: 279. Published online 2012 Jul 6. doi: 10.1186/1471-2407-12-279
- [33] Song L, Rini C, Ellis KR, Northouse LL. Appraisals, perceived dyadic communication, and quality of life over time among couples coping with prostate cancer. *Support Care Cancer*. 2016 Sep;24(9):3757-65. doi: 10.1007/s00520-016-3188-0. Epub 2016 Apr 2.
- [34] Hinyard L, Wirth LS, Clancy JM, Schwartz T. The effect of marital status on breast cancer-related outcomes in women under 65: A SEER database analysis. *Breast*. 2016 Dec 21;32:13-17. doi: 10.1016/j.breast.2016.12.008

- [35] Habtewold TD, Islam MA, Radie YT, Tegegne BS. Comorbidity of depression and diabetes: an application of biopsychosocial model. *Int J Ment Health Syst.* 2016 Dec 3;10:74. eCollection 2016.
- [36] Luttik M, Jaarsma T, Moser D, Sanderman R, van Veldhuisen DJ. The importance and impact of social support on outcomes in patients with heart failure: an overview of the literature *J Cardiovasc Nurs.* 2005 May-Jun;20(3):162-9.
- [37] van den Brink RH, Schutter N, Hanssen DJ, Elzinga BM, Rabeling-Keus IM, Stek ML, Comijs HC, Penninx BW, Oude Voshaar RC. Prognostic significance of social network, social support and loneliness for course of major depressive disorder in adulthood and old age. *Epidemiol Psychiatr Sci.* 2017 Feb 10:1-12. doi: 10.1017/S2045796017000014.
- [38] Mitchell RE, Moos RH. Deficiencies in social support among depressed patients: antecedents or consequences of stress? *J Health Soc Behav.* 1984 Dec;25(4):438-52
- [39] Carver CS, Smith RG, Petronis VM, Antoni MH. Quality of life among long-term survivors of breast cancer: Different types of antecedents predict different classes of outcomes. *Psychooncology.* 2006 Sep;15(9):749-58.
- [40] Ramadas A, Qureshi AM, Dominic NA, Botross NP, Riad A, Thirunavuk Arasoo VJ, Elangovan S. Socio-demography and medical history as predictors of health-related quality of life of breast cancer survivors. *Asian Pac J Cancer Prev.* 2015;16(4):1479-85.
- [41] Faghani S, Mohammadian R, Rahmani A, Mohajjel-Aghdam AR, Hassankhani H, Azadi A. Supportive Care Needs of Iranian Cancer Survivors and Relationships with Social Support. *Asian Pac J Cancer Prev.* 2015;16(15):6339-45.
- [42] Kwan ML, Ergas IJ, Somkin CP, et al. Quality of life among women recently diagnosed with invasive breast cancer: the Pathways Study. *Breast Cancer Res Treat.* 123(2):507-24, 2010.
- [43] Reynolds P1, Hurley S, Torres M, Jackson J, Boyd P, Chen VW. Use of coping strategies and breast cancer survival: results from the Black/White Cancer Survival Study. *Am J Epidemiol.* 2000 Nov 15;152(10):940-9.
- [44] Phillips KA, Osborne RH, Giles GG, Dite GS, Apicella C, Hopper JL, Milne RL. Psychosocial factors and survival of young women with breast cancer: a population-based prospective cohort study. *J Clin Oncol.* 2008 Oct 1;26(28):4666-71. doi: 10.1200/JCO.2007.14.8718.
- [45] Epplein M, Zheng Y, Zheng W. Quality of life after breast cancer diagnosis and survival. *J Clin Oncol.* 2011;29:406–12.

- [46] Korkeila, K, Suominen, S, Ahvenainen, J., Ojanlatva, A., Rautava, P., Helenius, H., Koskenvuo, M. Non-response and related factors in a nation-wide health survey. *Eur J Epidemiol* 2001; 17: 991–999.